

## ABSTRACT

The present invention comprises a nozzle type atomizer with two or more aligned "horn" stages. The definition of a "horn" stage is well known in the prior art as an effectively half wavelength length and a tapering shape with a central conduit. The present invention uses  
5 two to five, or more, horn stages integrally attached end to end. The dramatic improvement in amplitude of the vibration at the tip of the nozzle is without precedence in the prior art. The present invention makes application of transducer vibration at greater than 200 kHz possible. The present invention reduces the required applied energy for generating the  
10 necessary amplitude at the tip by the discovery of amplitude multiplication with two or more horn stages.